

Claims

1. A container (10) for interior cooling by reception of microwave radiation, comprising:
 - a lid (20);
 - at least one integrated electrical cooler (70);
 - at least one integrated microwave receiving rectenna (50); and
 - at least one integrated microwave shield (60) for shielding microwaves from reaching the interior of the container (10);
 - wherein container incident microwaves are received and converted into direct-current voltage through the rectenna (50), which powers the electrical cooler (70) for cooling the interior of the container (10).
2. A container according to claim 1, wherein the cooler (70) is a peltier cooling element.
3. A container according to claims 1-2, wherein the rectenna (50) comprises at least one microwave receiving antenna, a low pass filter, a rectifying diode, a DC filter and a load resistor.
4. A container according to claims 1-3, wherein the microwave shield (60) is a metal sheet or metal net with small apertures.
5. A container according to claims 1-4, wherein the rectenna (50) is a diode rectenna.
6. A container according to claims 3-5, wherein the antennas are dipole, patch or loop antennas or an array of such antennas.
7. A container according to claims 1-6, wherein the electrical cooler (70), the rectenna (50) and the microwave shield (60) are integrated as separate layers in the walls (20, 30, 40) of the container.
8. A container according to claim 7, wherein a bottom wall-section (40) comprises an outermost microwave-shield layer (60), a rectenna electric circuit layer and an innermost electric cooling layer (70).
9. A container according to claims 7-8, wherein a closed side wall-section (30) comprises an outermost microwave-receiving rectenna layer (50), a microwave-shield layer (60) and an innermost electric cooling layer (70).
10. A container according to claims 1-9, wherein the lid (20) comprises at least one of an outermost microwave receiving rectenna layer (50), a microwave-shield layer (60) and an innermost cooling layer (70).
11. A container according to claims 1-10, wherein incident microwaves are received by the rectenna antennas in the lid- and side wall-sections (20, 30) and are converted into

direct-current voltage (DC) through the electric circuitry of the rectenna, which is integrated in the bottom wall-section (40) for powering the electrical coolers (70) in the innermost bottom and side wall-sections (30, 40) of the container for cooling its interior through the innermost bottom and side wall-section surfaces.

- 5 12. A container according to claims 1-11, wherein it is manufactured in aluminum, plastic or ceramic material.
13. A container according to claims 1-11, wherein it is manufactured in a microwave absorbing material.
14. A container according to claims 1-13, wherein it has rounded forms.
- 10 15. A container according to claims 1-14, wherein the microwave radiation is provided by a microwave oven.
16. A container according to claims 1-15, wherein a thermometer is integrated in the container displaying a temperature of at least one of the container (10), cooler (70) and a content provided therein.
- 15 17. Method for cooling contents in a container by microwave radiation, said container comprising a lid, at least one integrated electrical cooler, at least one integrated microwave receiving rectenna, and at least one integrated microwave shield for shielding microwaves from reaching the interior of the container, comprising the method steps of:
 - sealing the container through closing the container lid;
 - 20 applying microwave radiation onto the outer surfaces of the container by utilizing a microwave oven; and
 - wherein container incident microwaves are received and converted into direct-current voltage (DC) through the rectenna, which powers the electrical cooler for cooling the interior of the container and its contents.
- 25 18. A method according to claim 17, wherein the cooling is accomplished by an integrated peltier cooling element.
19. A method according to claims 17-18, wherein the rectenna is arranged to comprise at least one microwave receiving antenna, a low pass filter, a rectifying diode, a DC filter and a load resistor.
- 30 20. A method according to claims 17-18, wherein the microwave shield is arranged to comprise a metal sheet or metal net with small apertures.
21. A method according to claims 17-19, wherein the rectenna is arranged to comprise a diode rectenna.
22. A method according to claims 19-21, wherein the antennas are arranged to
35 comprise dipole, patch or loop antennas or an array of such antennas.

23. A method according to claims 17-22, wherein the electrical cooler, the rectenna and the microwave shield are arranged to be integrated as separate layers in the walls of the container.

5 24. A method according to claim 17-23, wherein a bottom wall-section of the container is arranged to comprise an outermost microwave-shield layer, a rectenna electric circuit layer and an innermost electric cooling layer.

25. A method according to claims 17-24, wherein a closed side wall-section of the container is arranged to comprise an outermost microwave-receiving rectenna layer, a microwave-shield layer and an innermost electric cooling layer.

10 26. A method according to claims 17-25, wherein the lid of the container is arranged to comprise at least one of an outermost microwave receiving rectenna layer, a microwave-shield layer and an innermost cooling layer.

15 27. A method according to claims 17-26, wherein incident microwaves are received by the rectenna antennas in the lid- and side wall-sections and are converted into direct-current voltage through the electric circuitry of the rectenna, arranged in the bottom wall-section, for powering the electrical coolers in the innermost bottom and side wall-sections of the container thus cooling the interior of the container through the innermost bottom and side wall-section surfaces.

20 28. A method according to claims 17-27, wherein the container is manufactured in aluminum, plastic or ceramic material.

29. A method according to claims 17-27, wherein the container is manufactured in a microwave absorbing material.

30. A method according to claims 17-29, wherein the container is manufactured with rounded forms.

25 31. A method according to claims 17-30, wherein the microwave radiation is provided by a user activation of the microwave oven.

32. A method according to claims 17-31, wherein a thermometer, integrated in the container, displays a temperature reading of at least one of the container, coolers and the content provided therein.

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